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Temporal Structure in a Gesture Production Task

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'Language' without language

Human language is sophisticated: we communicate complex meanings using complex rule-governed utterances. **What happens when we remove the rules?** I.e., what happens when people cannot use their native language and are forced to communicate in the absence of linguistic conventions? Below are two situations in which this is the case.

The Basic Variety

The Basic Variety is an early stage in the acquisition process of adults who learn a second language without instruction, in which there is little influence of source and target language. In this stage, learners create simple (e.g., they do not inflect verbs) and short utterances, but they are communicatively successful. Jackendoff (2002) observed that word order in the Basic Variety is governed by the properties of the meaning to be conveyed.

Improvised communication

Goldin Meadow et al. (2008): when people are asked to convey the meanings of simple events (e.g. pirate throws ball) using only gesture and no speech (improvised communication), they bypass the rules of their native language and consistently use SOV word order: subject-object-verb. Schouwstra (2012) showed that (like for Basic Variety) word order is governed by semantic properties.

Goal

Schouwstra (2012) claims that both systems can tell us something (in similar ways) about the mechanisms that played a role in the emergence of language: with no full system of linguistic conventions in place, meaning determines structure. The current study provides further evidence for this claim, by looking at the expression of **complex information** in these systems.

Complex information: events on a timeline

One way to make simple events more complex is by adding information about the time of the event:

'A pirate throws a ball' --> 'A pirate threw a ball yesterday.'

Semantically, the following happens: the temporal adverb 'yesterday' creates a **temporal frame**, a place on the timeline in the context of which the remaining information is interpreted. De Swart (1999) shows that a temporal adverb most suitably creates a temporal frame when it is placed in front of an utterance. In the Basic Variety, this mechanism is put to use as follows.

Time in the Basic Variety

Language learners in the Basic Variety do not inflect verbs, so they cannot mark future and past tense, but they still talk about the past and future from a very early stage in the acquisition process. They do this by using temporal adverbs in front of utterances:

L1: Turkish, L2: German

Turkei urlaub + meine Mann krank

Turkey vacation+ my husband ill

Von Stutterheim & Klein (1987)

Time in improvised communication: hypothesis

If there is indeed a conceptual connection between the Basic Variety and the improvised communication experiment, asking participants in an improvised communication experiment to convey information about events remote in time should result in the same mechanism: [temporal adverb][simple event].

Method

To test if participants engaged in improvised communication use the same mechanism as Basic Variety speakers (fronting a temporal adverb to talk about events remote in time), we devised an experiment with **temporal events**.



A description in Dutch of the example picture above has three possible orders:

(TVSO)

Om drie uur eet een kabouter pizza.

At three o'clock eats a gnome pizza

(SVTO)

Een kabouter eet om drie uur pizza.

A gnome eats **at three o'clock** pizza

(SVOT)

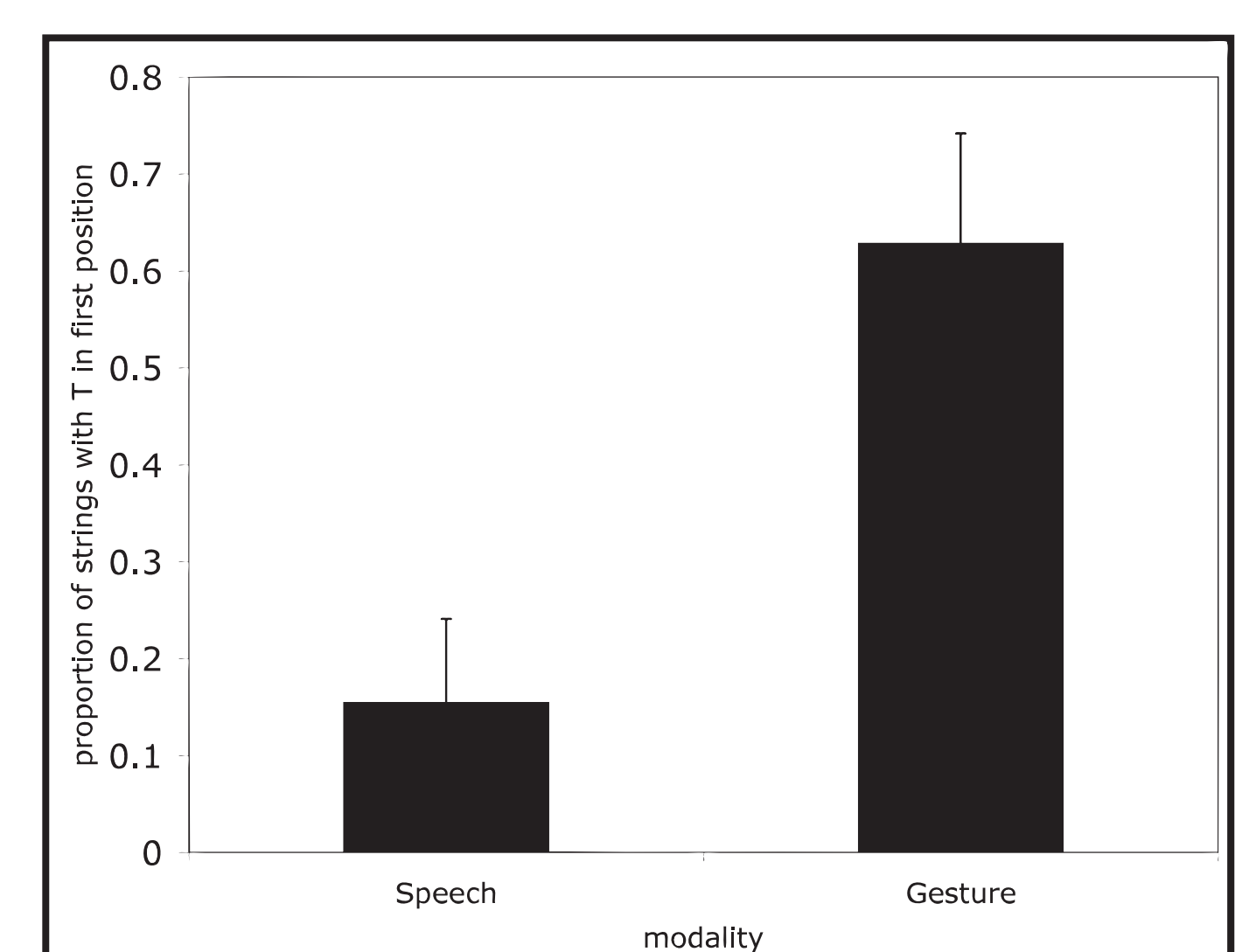
Een kabouter eet pizza om drie uur.

A gnome eats pizza **at three o'clock**

We asked 16 participants (9 male; 7 female, all native speakers of Dutch, none had previous knowledge of any conventional sign language) to describe 16 pictures of temporal events (all pictures showing a simple event plus a clock showing a time). First in spoken Dutch; then by using no speech and only gesture. We recorded and transcribed the spoken sentences, and video taped and transcribed the gesture sequences.

Results

A comparison of the speech strings and gesture strings reveals that the proportion of strings with the temporal adverb in front of the sentence is bigger for gesture strings than for speech strings.



Conclusion

The mechanism that was observed in the Basic Variety (placing a temporal adverb in front of a sentence to talk about events remote in time) was replicated in a laboratory with improvised communication. In both settings, utterance structure mirrors the semantic temporal frame mechanism. This strengthens the hypothesis that in language systems without full syntax, meaning determines structure.

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